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Human Factors and Reliability

James Bunsen

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- Introduction
- Human Factors
 - Procedures
 - Environment
 - Attention
- Reliability
 - Human
 - Machine
- Summary/Application

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Introduction

- What are Human Factors?
 - Knowing how Human Abilities, Characteristics, and Limitations Effect Work
 - Ergonomics and Human-Centered Design
- What is Meant by Reliability?
 - How Likely is the System to Perform as Intended
 - Human vs Equipment Reliability

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Human Factors Importance

- Reduces Errors
- Usability
- Productivity
- Personnel Satisfaction
- Safety

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Human Factors to NCS

- Fissile Material Ops is High-Risk, High-Consequence Systems
- Heavily Rely on Administrative Controls
- Fissile Material Handler Training Program
 - Mixture of Hands on Training and Classroom Programs
- Human Element Primary Cause For Most Accidents

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Effects on Human Factors

- Holidays
- Work Load
- Stress
- Unfamiliarity
- Environmental



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Reliability

- Human Reliability
 - Active Failures
 - Adherence to Admin. Controls
 - Latent Conditions
 - Interpretation and Use of Procedures
- Equipment Reliability
 - Hardware
 - Valves Leak, Dials Fail
 - Software
 - Failure of Mass Tracking Software



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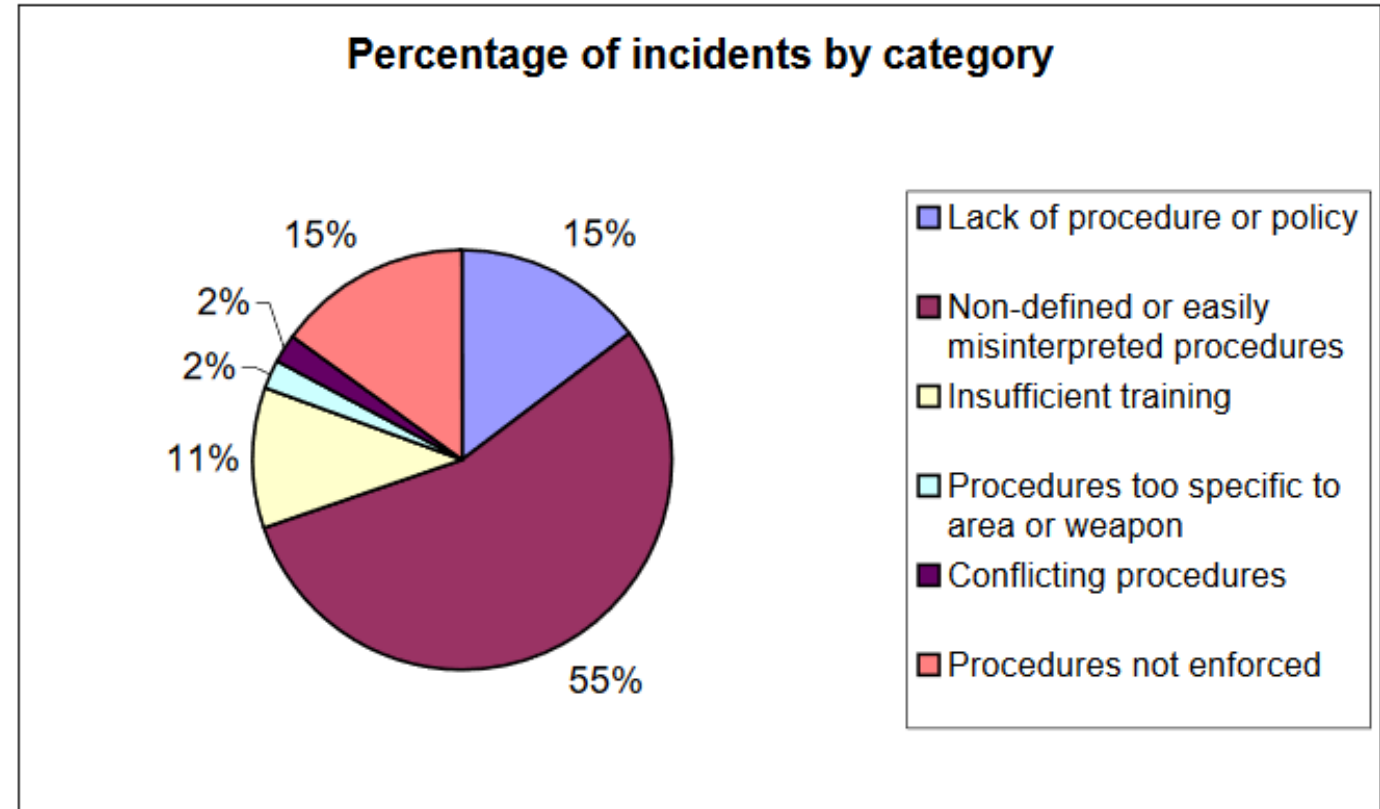
Use of Procedures

- Provide Administrative Controls to Help Prevent Hazards
- Make Users Tasks Easy and Straightforward
- Should Include Crit Controls
- Regular Revision by NCS

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Problems with Procedures

- Ambiguous/Vague Steps
- Inaccurate Information
- Critical Info Missing
- Lack of Graphics
- Overusing Critical Steps
- References other Procedures



SAND2004-5416, *Human Error Mitigation*

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Examples

- Car Window, Old Crank Vs New Button
- Requiring use of big, heavy container
- Use of Personnel Protective Equipment
- Color Blindness
- Having Different Limits Throughout a Room
- Staging Material

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